75024

ASTERIAS
Nantucket Sound

CRUISE REPORT

MASSACHUSETTS COOPERATIVE

UNIBOOM SEISMIC - NANTUCKET SOUND

Research Vessel - ASTERIAS

October 17th - October 30th, 1975

U. S. Geological Survey
Office of Marine Geology
Woods Hole, Massachusetts
02543

C. J. O'Hara

ASTERIAS OCT. 75
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INTRODUCTION

A high-resolution subbottom seismic profiling survey was conducted in Massachusetts coastal waters south of Cape Cod (Nantucket Sound) by the U. S. Geological Survey from October 17th through October 30th, 1975. The offshore investigation represents part of a continuing marine geologic program, funded jointly by the Department of Public Works of the Commonwealth of Massachusetts and the U. S. Geological Survey, Office of Marine Geology, Woods Hole. The survey was carried out aboard the WHOI research vessel ASTERIAS under Captain Dick Colburn.

OBJECTIVES

The cooperative program is designed to provide detailed geological information and assessments of potential mineral resources pertaining to that part of the continental shelf beneath the coastal waters of Massachusetts. In anticipation of the development of offshore natural resources of the Commonwealth, the focus of the research effort is directed toward the occurrance, nature and distribution of these deposits as well as the establishment of baseline data for evaluation of environmental impact of expliotation.

The subbottom profiling surveys provide the foundation for a planned program of vibracoring and bottom sampling of shallow subsurface and bottom geological features. Laboratory analysis of the vibracore and bottom samples will evaluate the economic importance of the deposits and, coupled with the seismic data, provide information on the geology and geologic history of the area.

SHIPBOARD SYSTEMS

The following systems were in operation during the survey:

EG&G Uniboom Catamaran with mounted transducer
EG&G Capacitor Bank

Geodyne Hydrophone Streamer
EPC Seismic Recorder (#154)
Del Norte Seismic Amplifier
Epsco Loran-C Receiver (latest model)
Krohn-Hite Band Pass Filter

PERSONNEL

The following U.S.G.S. personnel participated over the course of the survey:

Charles J. O'Hara	Scientist-in-charge
Dick Sylwester	Electronic Technician
Patricia Forrestel	
Wayne Ferrebee	
Elizabeth Winget	
Robert Commeau	

During the early part of the Survey, horizontal banding (extra pulses?) noted in the water column portion of the seismic record were observed reverberating through and masking the shallow subbottom reflectors. Check-out of all systems (filter, amp, etc.) external of the Uniboom system indicated no malfunction. The catamaran transducer and power supply were sent to EG&G in Waltham, Mass. for checkout. Examination revealed a perforation in the rubber diaphragm which allowed some air into the transducer. A new air-tight diaphragm was mounted and subsequent seismic records obtained were markedly improved. The survey was run daily out of Woods Hole, generally terminated by early afternoon due to the buildup of sea state conditions.

STATISTICS

Downtime

5.5 days - inclement weather
4.5 days - system malfunction and repair
0.5 days - development of engine trouble aboard the ASTERIAS.

Actual Survey time - 2.5 days

~ 11 days at sea

A total of 125 nautical miles (231 km) of high-resolution seismic data was finally obtained with subbottom penetration of up to 80 meters.

Figure I shows area of investigation and tracklines completed to date.

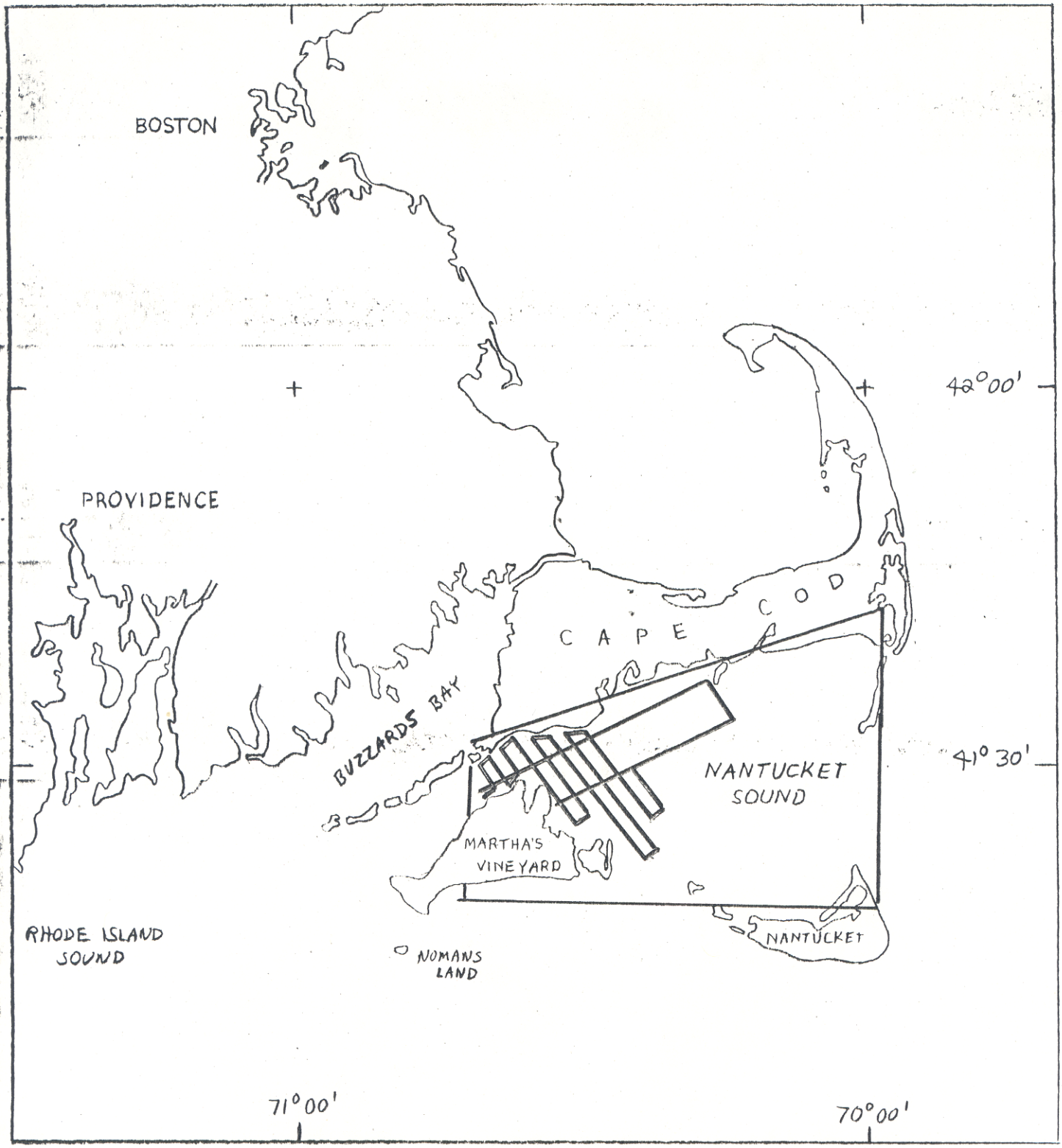
BOSTON
PROVIDENCE
42°00'
41°30'
CAPE COD
BUZZARDS BAY
NANTUCKET SOUND
MARTHA'S VINEYARD
NANTUCKET
RHODE ISLAND SOUND
NOMANS LAND
71°00'
70°00'
NAUTICAL MILES
0 5 10 15 20
KILOMETERS
0 10 20 30 40

FIGURE 1